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MATERNAL HEALTH

Emergency obstetric care: Making the impossible possible through task shifting

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ABSTRACT

Task shifting—moving tasks to healthcare workers with a shorter training—for emergency obstetric care (EmOC) can potentially improve access to lifesaving interventions and thereby contribute to reducing maternal and neonatal morbidity and mortality. The present paper reviews studies on task shifting for the provision of EmOC. Most studies were performed in Sub-Saharan Africa and South Asia and focused primarily on task shifting for the performance of cesarean deliveries. Cesarean delivery rates increased following EmOC training without significant increase in adverse outcomes. The paper discusses the advantages and disadvantages of task shifting in EmOC and the role of this approach in improving maternal and newborn health in the short and long term.

1. Introduction

The majority of global maternal deaths occur in Sub-Saharan Africa (62%) and Southern Asia (24%) due to preventable and treatable complications such as hemorrhage, hypertensive disorders, prolonged and obstructed labor, and sepsis [1–4].

Skilled health workers are needed to provide lifesaving essential interventions to prevent and treat complications [3,4]. Shortage of skilled health workers remains a major obstacle to achieving Millennium Development Goals 4 and 5 [2,3] In rural areas where mortality and morbidity rates are the highest and healthcare workers are most needed, the number of available healthcare workers is the lowest [5]. Lack of finances for training programs, loss of personnel to HIV/AIDS and other associated diseases, and the brain drain from rural to urban areas and from low-income to high-income countries, all contribute to this shortage [6,7].

Task shifting—the process whereby specific tasks are moved, where appropriate, to health workers with shorter qualifications and shorter trainings—is one approach to addressing the problem of insufficient workforce. Applying task shifting to basic and comprehensive emergency obstetric care (EmOC) could improve access to lifesaving interventions and thereby reduce maternal and neonatal morbidity and mortality [3,4].

Task shifting has been happening over decades, either consciously or unconsciously, and is not a recent intervention [8]. Recent studies of interest (published from 2003) cover the safety aspects of task shifting by looking at provider performance and patient outcomes, advantages and disadvantages including provider and user experiences, and barriers to and facilitators of task shifting.

Most studies discussed in the present paper that address task shifting in EmOC were performed in Sub-Saharan Africa and South Asia. Some studies compared nonphysician clinicians with doctors, while others compared doctors with different levels of training, for example, generalist doctors with specialists. Terms used to describe different physician and nonphysician healthcare workers vary between studies and countries, similarly duration of training. It is difficult to judge the competence and clinical practice level of a healthcare worker based on job title alone. Other factors influence performance such as availability of equipment, skills of other co-workers, workload, feedback, leadership, and access to clinical guidelines [9].

2. Safety

A major concern of task shifting is the quality and safety of interventions performed by health workers with "less training." Several recent studies report on the outcomes of tasks or interventions performed by different types of health workers, including health workers who only received a limited amount of training. Most studies on performer outcomes focus on cesarean deliveries and other obstetrical surgeries. Some studies report on anesthesia and neonatal resuscitation.

In Malawi, where nonphysician clinicians (clinical officers with three years of training) performed 90% of surgeries, no major differences were found between postoperative outcomes such as maternal death, wound infection, and need for reoperation for emergency obstetric surgeries, mainly cesareans, performed by nonphysician clinicians and physicians [10].

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Nonphysician clinicians in Ethiopia often perform the bulk of emergency obstetric procedures including cesarean deliveries, manual removal of placenta, and uterine evacuations. Outcomes (maternal death, fetal death, and length of hospital stay) of surgeries performed by nonphysician clinicians were comparable to those performed by physicians [5].

Nyamtema et al. [11] reported on a three-month training program to create teams providing EmOC (assistant medical officers) and anesthesia (nurses, midwives, or clinical officers) in Tanzania. The performance of the EmOC teams was considered "acceptable" since only one severe complication occurred out of 278 major obstetric surgeries in the training period and the stillbirth rate was reduced in the training period.

Also in Tanzania, McCord et al. [12] found no significant differences in outcomes, risk indicators, or quality of complicated deliveries and/or major obstetric surgeries performed by assistant medical officers (nonphysician clinicians who receive an additional two years of training) and medical officers (doctors).

In contrast with the other papers, Hounton et al. [13] found a significant difference in newborn case fatality rates (CFR) per thousand live births among obstetricians (CFR 99), general practitioners (CFR 125) and clinical officers (CFR 198) who received additional surgical training in Burkina Faso. No significant differences were found in maternal case fatality rates. The indication for and relevance of cesarean delivery, the clinical conditions of mother and fetus on arrival, and delays before performing the procedure were not taken into account [13].

Overall, most recent studies indicate that the quality of emergency obstetric surgeries is not at risk when performed by a less-skilled health worker. This is confirmed by a meta-analysis performed by Wilson et al. [14], which included some older studies comparing the outcomes of cesarean delivery performed by clinical officers with those performed by medical doctors. Surgeries done by clinical officers were more likely to be associated with wound infection (odds ratio [OR] 1.58; 95% CI, 1.01 − 2.47) and wound dehiscence (OR 1.89; 95% CI, 1.21 − 2.95) compared with medical doctors, but no significant differences were found for the other outcomes.

In Malawi, a prospective study showed that a cesarean delivery supported by nonphysician clinicians with no formal training in anesthesiology was associated with an increased maternal mortality (adjusted OR 2.9; 95% CI, 1.6 − 5.1) compared with cesarean delivery supported by nonphysician clinicians with a formal training in anesthesiology [15].

Approximately 5% − 10% of all neonates born need simple stimulation (drying and rubbing) to help them breathe, 3% − 6% require basic resuscitation (bag-and-mask ventilation), and only less than 1% advanced resuscitation (chest compressions, drugs) [16]. The meta-analysis of observational before-and-after studies by Wall et al. [16] reported a 30% reduction in intrapartum-related neonatal mortality after introduction of training in neonatal resuscitation, and that a broad range of healthcare workers including nonphysician clinicians, traditional birth attendants, and community health workers can perform neonatal resuscitation [16].

Finally, two studies used clinical vignettes covering topics such as postpartum infection management and acute complications of labor to assess clinical competence of obstetric care providers. In Mali, physicians (78.6 ± 13.4) had higher clinical competence scores (out of 100) compared with obstetric nurses (57.8 ± 11.2) and midwives (66.4 ± 14.7). However, obstetric nurses and midwives had slightly higher scores for neonatal care compared with physicians. Health workers working in rural referral centers scored lower than those working in urban centers [9].

Of the 233 skilled birth attendants in India assessed for their EmOC skills, only 14% were competent at initial assessment, 58% were able to make a correct clinical diagnosis, and 20% were competent at providing appropriate first-line care [17].

3. Advantages and disadvantages of task shifting

Pereira et al. [7] performed a retrospective study underscoring the large contribution of nonphysician clinicians in meeting unmet need; 85% of all cesareans deliveries were performed by nonphysician clinicians. Unfortunately, the percentage of cesareans performed overall (2.2% − 2.8%) was still far below the recommended 5% level [4]. Nyamtema et al. [11] found a 300% increase in the cesarean delivery rate after training and introducing EmOC teams. De Brouwere et al. [18] evaluated a task-shifting policy introduced in Senegal whereby district surgical teams including an anesthetist, general practitioner, and surgical assistant were trained to perform emergency obstetric surgery in district hospitals. Introducing a district team was regarded to save lives and reduce referral costs. The cesarean delivery rate remained below 1%; far below the UN recommended rate of 5% − 15% [4].

Utz et al. [19] used questionnaires to identify which EmOC skills are provided by cadres in Bangladesh, India, Nepal, and Pakistan. Most cadres performed newborn resuscitation and administered parenteral antibiotics and oxytocics. Doctors often performed manual removal of the placenta, removal of retained products of conception, and assisted vaginal delivery. The authors concluded that lives can be saved when cadres are trained to provide more EmOC skills. A more recent study showed that EmOC signal functions (vacuum extraction, removal of retained products) are performed in a limited number of EmOC facilities mainly because of inadequate knowledge and skills and missing supplies [20].

Spitzer et al. [21] investigated the effect of a five-day EmOC program on maternal and neonatal morbidity and mortality for health professionals in Kenya. They found an increase in administration of oxytocin and management of postpartum hemorrhage resulting in a decreased postpartum hemorrhage rate after introducing the training.

A qualitative study by Cumbi et al. [6] in Mozambique reported that surgically trained nonphysician clinicians or "technico de cirurgia" were considered essential to provide lifesaving surgical services in rural areas. Their work contributed to avoiding unnecessary referrals leading to lower costs and reduced workload of the referral hospitals.

An important reported advantage of training nonphysician clinicians in Mozambique is that unlike medical doctors who leave within three years, 88% of the nonphysician clinicians continue to work in the same hospital after seven years [22].

A cost-effectiveness analysis showed that the average cost per cesarean delivery when performed by an obstetrician, a nonspecialist doctor, or a clinical officer was US $513, US $207, and US $ 193, respectively. Although task shifting is cost-effective, the costs are still fairly high because lower than expected numbers of cesarean deliveries are performed by trained health workers in their facilities [13].

De Brouwere et al. [18] reported from Senegal that because anesthetists are trained only to provide anesthesia, they did not have enough work because of the low volume of cesarean deliveries performed in district hospitals. The authors suggest that training nonphysician clinicians as part of the district team to perform other surgical interventions would increase cost-effectiveness by using the available anesthesiologist(s).

Nyamtema et al. [11] reported that due to short training periods and the large groups of trainees, only some trainees were able to perform more complicated procedures such as vacuum delivery or intubation for general anesthesia.

Cumbi et al. [6] reported that the knowledge of nonphysician clinicians related to therapeutic management was insufficient. Chilopora et al. [10] noted that clinical officers have proper manual skills but may miss essential diagnostic accuracy; however, they concluded that more research is needed to compare these skills with those of medical officers.

Kouanda et al. [23] reviewed the medical records of 300 low-risk women who underwent intrapartum cesarean delivery in Burkina Faso and concluded that clinical officers performed more unnecessary cesarean deliveries than obstetrician-gynecologists (OR 4.46; 95% CI, 1.44 − 13.77).

A more recent study of interviews with 54 nonphysician clinicians providing EmOC who had received a 30-month advanced clinical and leadership training in Malawi, reported that trainees were able

to make positive changes in their practice after finishing training in performing a vacuum extraction or neonatal resuscitation. The effect of the training on maternal and neonatal mortality was not evaluated [24].

4. Barriers and facilitators

To make optimal use of task shifting it is important to have insight into the barriers and facilitators.

The main barriers identified in Senegal were resistance from senior academic clinicians, lack of career progression, and limited program coordination. These resulted in only six out of 11 teams functioning five years after the start of the program and long delays between completion of training and opening of operating theatres. An increased intervention rate was observed at the time a complete team was in place; however, the rates dropped synchronously when team members were absent. The lack of continuity is an important issue imperiling the ability of task-shifting policies to achieve their goal and meet obstetric need [18].

Mavalankar et al. [25] evaluated the experiences of 14 medical officers (doctors with a five-year degree) in India who received training in Life Saving Anaesthetic Skills (LSAS) for EmOC. Being posted at a healthcare facility without a specialist anesthesiologist and/or nonperforming or uncooperative EmOC provider, led to a higher likelihood of not using the anesthetic skills learned. Trained medical officers experienced difficulties combining their EmOC duties with their other duties. Resuscitation training was highly valued and also applied to newborns.

Evans et al. [26] reported important barriers to providing EmOC, especially cesarean delivery, after finishing a 16-week comprehensive EmOC training of 17 nonspecialist doctors in India. To start with, these officers were assigned to the training by the government (not volunteers). Some of them were not allowed to perform cesarean delivery during their training. Anesthetists were not present or refused to work with these trainees. Infrastructure (operating theatre, equipment) was often missing, and blood services were limited. The authors concluded that "training medical officers in comprehensive EmOC is only one piece of the puzzle" and that "training cannot occur in a vacuum" [26].

In Uganda, those in favor of task shifting argue that nonphysician clinicians already perform tasks of higher-trained health workers; those against argue that nonphysician clinicians are incompetent, overworked, and more expensive compared with trained health workers. Opponents of task shifting argue that, "Consumers of health services were either uninformed or ignorant about the competencies of the health providers and/or had no other options. They were also ignorant about their legal rights otherwise the cost compensating patients would be high" [27].

Cumbi et al. [6] identified that the interaction of nonphysician clinicians, especially with medical doctors, is problematic. This may be because nonphysician clinicians are seen "king" because they perform lifesaving surgery. The doctor is "only" prescribing medicines. This attitude may stir resistance from doctors to further implement task shifting and/or working with nonphysician clinicians.

Colvin et al. [28] noted that legal protections and liabilities and the regulatory framework for task shifting should be designed to accommodate new task-shifted practices and stressed that managing inter-professionally is important.

5. Discussion

The increased numbers of health workers providing lifesaving EmOC interventions is a major advantage of task shifting in EmOC. In some countries, the bulk of cesarean deliveries and other obstetric operations is currently performed by nonphysician clinicians [6,22].

However, improving access to EmOC and increasing intervention coverage rates may not directly lead to reductions in maternal and neonatal mortality and morbidity. The quality of the intervention provided is at least as important as coverage rates to improve maternal and newborn health. Although current studies do not show major differences in patient outcomes with task shifting, other important problems have been identified that could potentially undermine the positive effects of task shifting [14].

Task shifting is currently seen as a vertical approach focusing on training of selected cadres to perform one specific procedure. Focusing on training nonphysician clinicians to perform cesarean deliveries without addressing other issues in the health system could lead to new and different problems; for example, a nonphysician clinician available to perform a cesarean but no anesthesiologist or operating theatre.

Although 75% of surgical procedures, including cesarean delivery, in most low-resource countries are at low levels of complexity and do not require fully-trained doctors, decision making, for example, on whether or not to perform a cesarean is thought to be more complex and may not be satisfactorily addressed by task shifting [18,23].

The duration and location of the training and the limited emphasis on keeping skilled health workers skilled are other issues to be considered. Training should be in places with sufficient number of births and complications. Often these are in large referral hospitals where infrastructure and supporting resources are likely to be different from those of the trainees. In these centers, trainees on short-term courses may have to compete for learning opportunities with specialist trainees on longer-term training courses in the same institution. In addition, health workers may receive only a one-time training, with no additional refresher courses on offer.

Finally, there is a paucity of information on the perspectives of women and their families on task shifting in EmOC. It is important to share information on the potential benefits and harms of task shifting with women, their families, and communities and take their preferences into account while making policy decisions that affect their lives.

While EmOC is needed for management of complications, it is also important to remember that investing in providing good quality essential care during pregnancy and childbirth will reduce the risk of major complications, and thus the need for many EmOC interventions. This would also make task shifting in EmOC an interim solution while working toward long-term health system strengthening.

Conflict of interest

The authors have no conflicts of interest.

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